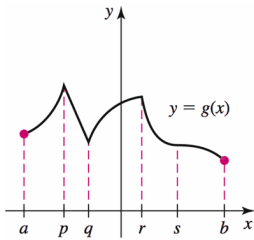


October 14

TA: Brian Powers

1. On the following graph to determine at what x values on the interval $[a, b]$ local and absolute extreme values occur.



2. Sketch the graph of a function on the interval $[0, 4]$ with the following properties:
 $f'(x) = 0$ for $x = 1, 2,$ and 3 ; f has an absolute minimum at $x = 1$; f has no local extremum at $x = 2$; and f has an absolute maximum at $x = 3$.
3. Find the critical points of the following functions on the domain given, and try to classify each as a local minimum, maximum or neither.
- $f(x) = 3x^2 - 4x + 2$ on $(-\infty, \infty)$
 - $f(x) = (e^x + e^{-x})/2$ on $(-\infty, \infty)$
 - $f(x) = \sin x \cos x$ on $[0, 2\pi]$
4. Find the critical points of f on the given interval and determine the absolute extreme values of f if they exist.
- $f(x) = x(x^2 + 1)^{-2}$ on $[-2, 2]$
 - $f(x) = \sin(3x)$ on $[-\pi/4, \pi/3]$
 - $f(x) = x \ln(x/5)$ on $[0.1, 5]$
5. Find the local and extreme values of $f(x) = |x - 3| + |x + 2|$ on $[-4, 4]$.
6. You are running along the shore from point P towards point Q which is 50m away. 50m from Q perpendicular to the shore, there is a drowning swimmer. You can run at 4m/s and swim at 2m/s. At what point x meters from Q should you jump into the water to swim if you want to minimize the time to get to the swimmer?

